

CLAIMS

What is claimed is:

1. A casting system comprising:

10 a multi-station casting processing system, comprising a first station and a second station; and,

a mobile furnace comprising a heating element, wherein said mobile furnace is movable between said first station and said second station.

15 2. The system of claim 1, wherein said mobile furnace further comprises a door.

3. The system of claim 1, wherein said multi-station casting processing system comprises a pouring station at which molten metal is poured into molds to form castings.

20 4. The system of claim 3, wherein said multi-system casting processing system further comprises a casting retractor for removing castings from said pouring station.

5. The system of claim 1, wherein said heating element comprises a radiant heating element.

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6. The system of claim 1, wherein said multi-station casting processing system comprises a fluidized bed.

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7. The system of claim 6, wherein said fluidized bed has a series of individual fluidized bed chambers.

8. The system of claim 7, wherein each of said fluidized bed chambers is heated independently.

9. The system of claim 6, wherein said fluidized bed chambers each include a removable lid.

10. The system of claim 9, wherein each of said removable lids includes a casting support.

11. The system of claim 1, wherein said mobile furnace is a drop bottom furnace.

12. The system of claim 1, wherein said multi-station casting processing system further comprises a thermal arresting unit.

13. The system of claim 12, wherein said thermal arresting unit includes a radiant heating element.

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14. The system of claim 1, wherein said multi-station casting processing system comprises a quench tank.

15. The system of claim 1 and further comprising a transfer mechanism capable of transferring a casting between said mobile furnace and said first station.

16. The system of claim 15, wherein said transfer mechanism comprises a hoist
10 operably connected to said mobile furnace.

17. A system for producing and processing metal castings, comprising:
a casting station;
a heat treatment station; and
15 a mobile furnace for transporting the castings between said casting station and said heat treatment and having a heating element for maintaining the castings within a desired range of temperatures.

18. The system of claim 17, wherein said heating element of said mobile furnace is
20 capable of producing radiant heat.

19. The system of claim 17, wherein said heat treatment station comprises a multi-chambered fluidized bed.

20. The system of claim 19, wherein each of said fluidized bed chambers includes a
25 removable lid.

5 21. The system of claim 20, wherein each of said lids includes a casting support connected thereto and a hook for engagement and conveyance of the castings on said casting supports into said mobile furnace.

 22. The system of claim 17, wherein said casting station includes a tilt pour machine
10 for pouring a molten metal into molds to form the castings.

 23. The system of claim 17, wherein said casting station further comprises a casting retractor for removing the castings from their molds.

15 24. The system of claim 17, and further comprising a quench tank, wherein said mobile furnace is movable between said heat treatment station and said quench tank.

 25. The system of claim 24 and further comprising a quench tank casting transfer mechanism.

20 26. The system of claim 17, wherein said casting station comprises a thermal arresting unit having a heating element for maintaining the castings within a desired range of temperatures prior to transport to said heat treatment station.

25 27. The system of claim 17, further comprising a transfer mechanism capable of transferring a casting from said mobile furnace to said heat treatment station.

5 28. The system of claim 27, wherein said transfer mechanism comprises a hoist
operably connected to said mobile furnace.

 29. A casting system comprising:
 a casting machine;
10 a thermal arrest unit;
 a multi-chamber fluidized bed; and
 a mobile furnace comprising a heating element, wherein said mobile furnace is
movable between said thermal arrest unit and each chamber of said multi-chamber fluidized bed.

15 30. The casting system of claim 29 and further comprising a casting transfer
mechanism operably connected to said mobile furnace.

 31. The casting system of claim 29, wherein each chamber of said multi-chamber
fluidized bed comprises a removable lid having a casting support attached thereto.

20 32. The casting system of claim 29, further comprising a quench tank, wherein said
mobile furnace is movable between said multi-chamber fluidized bed and said quench tank.

 33. A method of producing metal castings comprising:
25 pouring a molten metal material into molds at a casting station to form the
castings;
 transferring the castings to a mobile furnace;

5 moving the mobile furnace and depositing the castings in a chamber of a heat treatment station; and

removing the castings from the heat treatment chamber to the mobile furnace after completion of heat treatment.

10 34. The method of claim 33, further comprising exposing the castings to a fluidized bed within the chamber of the heat treatment station.

35. The method of claim 33, further comprising applying heat to the castings while inside the mobile furnace.

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36. The method of claim 33 and wherein depositing the castings in a chamber comprises moving the mobile furnace from the casting station to one of a series of fluidized bed chambers of the heat treatment station.

20 37. The method of claim 36, wherein depositing the castings in a chamber further comprises lowering a lid from which the casting is suspended onto the processing station.

38. The method of claim 33, further comprising transferring the castings from their mold to a thermal arrest unit.

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39. The method of claim 33, further comprising quenching the castings.

5 40. The method of claim 33, further comprising:

 heat treating the casting at a fluidized bed chamber within the processing station;

 transferring the casting from the fluidized bed chamber to the mobile furnace;

 moving the mobile furnace; and

 transferring the casting from the mobile furnace to a second processing station.

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 41. The method of claim 40, further comprising exposing the casting to a second
fluidized bed within the second processing station.

 42. A method of processing a casting comprising:
15 transferring a casting into a mobile furnace;

 moving the mobile furnace to a first position;

 transferring the casting from the furnace to a processing station;

 processing the casting within the processing station;

 transferring the casting from the processing station back to the mobile furnace;
20 moving the mobile furnace to a second position; and

 removing the casting from the mobile furnace.

 43. The method of claim 42, wherein processing the casting within the processing
station comprises exposing the casting to a fluidized bed.

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 44. The method of claim 42, further comprising exposing the casting to radiant heat
within the mobile furnace.

5 45. The method of claim 42, wherein transferring the casting from the mobile furnace
to the processing station comprises lowering the casting from the mobile furnace into an
individual chamber of the processing station.

 46. The method of claim 42, further comprising transferring the casting from the
10 mobile furnace to a quench tank.